

Fabrication of Single Layer YBCO dc-SQUID Magnetometers with Multi-loop Pickup Coil Design

K.K. Yu, I.S. Kim, Y.K. Park

Korea Research Institute of Standards and Science, Daejeon, Korea

To improve the performance of the single layer direct coupled YBCO SQUID magnetometers, we optimized the SQUID by changing multi-loop pickup coil design and coupling scheme. The single layer YBCO SQUID magnetometers have been designed with SQUID inductance 100 pH, pickup coil composed of 16 parallel lines with outer dimension 8.8mm, and fabricated with YBCO thin films deposited on STO(100) bicrystal substrates with misorientation angle of 30°. Typical characteristics of the dc-SQUID magnetometers have modulation voltage of about 40 μV and white noise of about 30 fT/Hz^{1/2}. The SQUIDs exhibit reduced 1/f noise level at 10 Hz by factor of about 1/3 measured as compared with the conventional solid type pickup coil magnetometers, and demonstrated very stable flux-locked-loop operation in magnetically disturbed environment of laboratory.